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## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 503544 JBM/fxc	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/NZ2004/000078	International filing date (day/month/year) 23 April 2004	Priority date (day/month/year) 24 April 2003	
International Patent Classification (IPC) or national classification and IPC <b>Int. Cl.</b> 7 C12N 1/14, A01G 1/04, A01H 15/00			
Applicant UNIVERSITY OF WAIKATO et al			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a.  (*sent to the applicant and to the International Bureau*) a total of sheets, as follows:

sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b.  (*sent to the International Bureau only*) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or table related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

<input checked="" type="checkbox"/> Box No. I	Basis of the report
<input type="checkbox"/> Box No. II	Priority
<input type="checkbox"/> Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV	Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI	Certain documents cited
<input type="checkbox"/> Box No. VII	Certain defects in the international application
<input checked="" type="checkbox"/> Box No. VIII	Certain observations on the international application

Date of submission of the demand 23 November 2004	Date of completion of the report 22 March 2005
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer <b>ANITA PREMKUMAR</b> Telephone No. (02) 6283 2515

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/NZ2004/000078

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- This report is based on translations from the original language into the following language which is the language of a translation furnished for the purposes of:
- international search (under Rules 12.3 and 23.1 (b))
  - publication of the international application (under Rule 12.4)
  - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):
- the international application as originally filed/furnished
- the description:
- |        |  |
|--------|--|
| pages  | as originally filed/furnished                    |
| pages* | received by this Authority on with the letter of |
| pages* | received by this Authority on with the letter of |
- the claims:
- |        |   |
|--------|---|
| pages  | as originally filed/furnished                             |
| pages* | as amended (together with any statement) under Article 19 |
| pages* | received by this Authority on with the letter of          |
| pages* | received by this Authority on with the letter of          |
- the drawings:
- |        |  |
|--------|--|
| pages  | as originally filed/furnished                    |
| pages* | received by this Authority on with the letter of |
| pages* | received by this Authority on with the letter of |
- a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3.  The amendments have resulted in the cancellation of:
- the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to the sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to the sequence listing (*specify*):

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

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**Box No. V      Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Claims <b>1-49, 52, 61, 66, 67, 69-72</b>	YES
	Claims <b>50, 51, 53-60, 62-65, 68</b>	NO
Inventive step (IS)	Claims <b>1-49, 52, 61, 66, 67, 69-72</b>	YES
	Claims <b>50, 51, 53-60, 62-65, 68</b>	NO
Industrial applicability (IA)	Claims <b>1-72</b>	YES
	Claims <b>none</b>	NO

**2. Citations and explanations (Rule 70.7)**

The invention lies in a method for the isolation of a decay fungus that is capable of having a positive effect on wood or wood products. The fungus is able to degrade lignin and/or decrease extractives in wood and can out grow or inhibit the development of a competitor fungi as well as minimise/inhibit the detrimental effects of competitor fungi.

D1: Soares, C. H. L. and Duran, N.; Proceedings of the Brazilian Symposium on the Chemistry of Lignins and Other Wood Components, 4th, Recife, Brazil, Nov. 28-Dec. 1, (1995), 66-68.

D2: Archibald, F. S.; et al; Journal of Biotechnology (1997), 53 (2, 3), 215-236.

D3: Moreira, M. T.; et al; Applied and Environmental Microbiology (1997), 63 (5), 1749-1755.

D4: Reid, I.D.; Canadian Journal of Botany (1995), 73 (Suppl. 1, Sect. E-H, Fifth International Mycological Congress, Sect. E-H, 1994), S1011-S1018.

**Novelty:**

Claims 50-68 are directed towards a method of improving chemical/modified chemical pulping by using a decay fungus on wood that is used in pulping.

D1 and D4 disclose the use of decay white rot fungi that grow on wood and degrade lignin in the pulping industry. D1 also disclose the use of these fungi in bleaching effluent from bleached Eucalyptus Kraft pulp. As such, the citations disclose all the essential features of claims 50, 51, 53-60, 62, 65 and 68. D2 discloses a procedure of using *Trametes versicolor* (*Coriolus versicolor*) in the pulping industry to increase the brightness of hardwood kraft pulp and therefore anticipates claims 50, 51, 53-60, 62-65 and 68.

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**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. Claim 50 and appended claims 51-68 are not fully supported by the specification. The claims are directed toward a method of improving chemical or modified chemical pulping by using a composition containing a decay fungi. The fungi is applied to wood followed by chemical or modified chemical pulping.

The specification, however, is directed towards a method of isolation of a decay fungus that is capable of having a positive effect on wood or wood products. The fungus is able to degrade lignin and/or decrease extractives in wood and can out grow or inhibit the development of a competitor fungi as well as minimise/inhibit the detrimental effects of competitor fungi.

The claims seem to lack an essential feature of the invention- a decay fungus that can out grow or inhibit the development of a competitor fungi or minimise/inhibit the detrimental effects of competitor fungi. The claims include all decay fungi whether they are capable of inhibiting the growth of competitor fungi or minimising/inhibiting the detrimental effects of competitor fungi. The specification does not provide sufficient support to encompass all these fungi.

2. It is not apparent from the specification which isolate of the examples (15-A or 9C) is *Coriolus versicolor* AGAL Accession number NM02/3225 and if there are any special features associated with this particular strain.

3. Claims 11, 20, 29 and 36 refer to a biologically pure culture of decay fungi, a method of preparing a composition, a composition and a method of enhancing wood or wood products; using a decay fungi according to "the above method". It is not clear which "above method" is being referred to in these claims.

4. Claims 70-71 refer to the use of the fungus *Coriolus versicular* AGAL Accession number NM02/3225, however the specification discloses the fungus as *Coriolus versicolor* AGAL Accession number NM02/3225.

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**PCT/NZ2004/000078****Supplemental Box V****In case the space in any of the preceding boxes is not sufficient.****Continuation of:** 2**Inventive Step:**

The invention defined in claims 50, 51, 53-60, 62-65 and 68 is not inventive in light of prior art document D3. The problem addressed by the applicant in the claims is a method of improving chemical or modified chemical pulping by using a composition containing a decay fungi. The fungi is applied to wood followed by chemical or modified chemical pulping. Citation D3 is directed to a similar problem and in searching the art a diligent searcher investigating this problem could reasonably be expected to have found this document. D3 discloses a method for biobleaching of Eucalyptus kraft pulps as handsheets. The difference between the citation and the invention is the citation uses Eucalyptus kraft pulps as handsheets in place of wood to show improvement in pulping. As such, the citation clearly discloses the concept of using decay fungi for the purpose of improving chemical or modified chemical pulping and therefore it would be obvious to the PSA to try using the decay fungi on wood in place of the handsheets to get a similar result.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/NZ2004/000078

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
Int. Cl. 7: C12N 1/14, A01G 1/04, A01H 15/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) <b>SEE ABOVE</b>		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched <b>SEE BELOW</b>		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPIDS, AGRICOLA, CA. (wood, timber, pulp, fungi, pleurotus, coriolus, phanerochaete, phlebia, ganoderma, oxidat, isolat, select)		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Soares, C. H. L. and Duran, N.; Proceedings of the Brazilian Symposium on the Chemistry of Lignins and Other Wood Components, 4th, Recife, Brazil, Nov. 28-Dec. 1, (1995), 66-68. "Enzyme activities during biodegradation of bleached kraft pulp effluent by basidiomycetes fungi." (Whole document)	50, 51, 53-60, 62, 65 and 68
X	Archibald, F. S.; et al; Journal of Biotechnology (1997), 53 (2,3), 215-236. "Kraft pulp bleaching and delignification by Trametes versicolor." (Abstract; page 216, conclusions)	50, 51, 53-60, 62-65 and 68
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input type="checkbox"/> See patent family annex		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&amp;" document member of the same patent family</p>		
Date of the actual completion of the international search 28 June 2004	Date of mailing of the international search report 05 JUL 2004	
Name and mailing address of the ISA/AU  AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized officer  <b>Philippa Wyrdeman</b> Telephone No : (02) 6283 2554	

## INTERNATIONAL SEARCH REPORT

International application No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Moreira, M. T.; et al; Applied and Environmental Microbiology (1997), 63 (5), 1749-1755. "Manganese is not required for bio-bleaching of oxygen-delignified kraft pulp by the white rot fungus Bjerkandera species strain BOS55." (Abstract; Introduction; Materials and Methods; Results- page 1750, col 2, last 2 lines-page 1751, col 1; Discussion page 1753, col 1)	50, 51, 53-60, 62-65 and 68
X	Reid, I.D.; Canadian Journal of Botany (1995), 73 (Suppl. 1, Sect. E-H, Fifth International Mycological Congress, Sect. E-H, 1994), S1011-S1018. " Biodegradation of lignin." (Abstract; Introduction; Conclusion)	50, 51, 53-60, 62-65 and 68